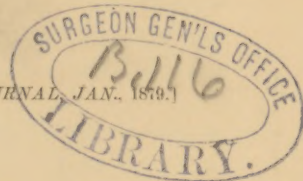# THE

EXTRACTION OF CATARACT

WITHIN THE

LENTICULAR CAPSULE.

BY

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THE EXTRACTION OF CATARACT WITHIN THE LENTICULAR CAPSULE.

It is the highest aim of cataract operation to render the pupil perfectly clear, entirely unobstructed by any fragment of the capsule or cortical substance. This condition, however, is hardly obtained by the different methods of extraction known as the linear, the modified linear, the flap operation or the discission, etc., since all these methods only aim at the extraction of the lenticular substance without removing the enveloping capsule.

The removal of the opaque crystalline lens, therefore, within its uninjured capsule must be regarded as the most sanguine result of a cataract operation.

The desire of accomplishing so perfect a result has already agitated the minds of several of our oldest ophthalmic surgeons. Their methods, however, were so crude, and their results obtained so rarely satisfactory, that it had to be abandoned.

How this method of operating was gradually developed may be seen from the following concise historical synopsis:

Sharp and Richter, independently of each other, and at about the same time (1773), were the first who performed it, without, however, describing their method. Beer followed in 1779. He proceeded by introducing a needle into the lens after the flap had been made, and then making several rotatory motions therewith in order to disjoin the lenticular system from its connections, and to extract it.

Moorenheim, in 1781, advised that external digital pressure should be exerted after the corneal incision had been made in order to ascertain whether the lens would not appear in its capsule.

In 1845 Christian, in 1857 Sperino, in 1865 Wecker, operated in the following manner: After the flap had been constituted, they simply pressed upon the wound-margin, in order to cause rupture of the zonula Zinnii, and consequent detachment of the posterior capsule from its adhesion; Alexander Pagenstecher, of Wiesbaden, perfected the operation greatly, and gave its proper indications.

We scarcely need to rehearse the ordinary mode of Graefe's modified linear incision, the operation is so well known by every oculist, and has rendered his name immortal.

One of the chief causes of an insufficient, and occasionally an unfavorable, result after this operation, however, consists in the lenticulo-capsular fragments, which remain in the eye. In this respect, it is indeed less the quantity which gives rise to the danger, but rather the quality of these remnants. Their presence may prevent the union of the lips of the incision, or they may push the iris forward and thus cause a prolapse. Even if this does not take place, an iritis may be caused, or their fragments may lead to secondary cataract (Arlt, "Operationslehre," Handb. Graefe-Saemisch, 3), with or without synechia. Iritis, however, produced either by direct injury during the operation, as traction or pressure, or—as is most commonly the case—by the traumatic influence of lenticulo-capsular fragments, is apt to cause a great number of dangerous conditions. Posterior synechia, pupillary occlusion, or even panophthalmitis may thereby be called forth.

That the excision of a broad piece of iris acts in a measure as a prophylactic is undoubted. The second stage of the

operation, as first recommended and practiced by Moorenheim (that is, the iridectomy), has certainly saved many eyes from destruction. It will be shown, however, in the following pages, that even after the largest iridectomy the presence in the eye of, more especially, the capsular fragments is a predisposing cause to inflammation of the iris and its very dangerous succedanea.

Even if there were no danger of ensuing iritis from the presence of fragments of the capsule in the eye, the result can never be as perfect from an optical point of view as if the lens with its uninjured capsule were removed together.

"If we were possessed of a means," says Arlt, "safely to remove the lens *in toto* (in other words with its capsule), we would record less losses and by far a lesser number of unsatisfactory results." It is my purpose to direct attention to such a means, and base my statements on a large number of cases operated by me according to this method during the last ten years.

Prior to proceeding therewith, I shall review the anatomical relation existing between the lens and the surrounding parts, for thereupon depends the *rationale* of the method.

The only *organic* connection of the lens is that with the hyaloid membrane; however, it is in close and intimate connection with the ciliary region, and the zonula Zinnii constitutes the band of union. The capsule, which incloses the lens on all sides, is consequently a continuous membrane, although for the sake of description it has been divided into an anterior and posterior capsule. The posterior capsule is quite firmly attached to the hyaloid fossa, and this portion of the vitreous (that is, the anterior part) is adherent to the ciliary body and the pars ciliaris retinæ. To remove the lens in its capsule, therefore, it would be necessary to loosen its margin from the connection to the zonula, and then exert external pressure in order to promote its escape; or to accomplish this by some other means, as by the introduction of an instrument between the hyaloid fossa and the posterior capsule.

This mechanical intrusion would perhaps lead to the rup-

ture of the hyaloid with consequent loss of more or less vitreous or the probable rupture of the capsule, providing the conditions in the eye were perfectly normal, and the anatomical relations existing between the lens and the neighboring parts were not altered.

In a large percentage of senile cataracts certain pathological changes do take place, however, which modify these anatomical relations to a great extent, and which render the dangers of a mechanical intrusion between the lens-capsule and the hyaloid almost *nil*.

In the first place, there are changes affecting the zonula itself; then, there are changes which befall the lens and its capsule; and, lastly, those which happen to the anterior part of the eyeball.

The following changes in structure take place in the zonula Zinnii: Its fibers, ordinarily strong, become atrophic, and the result is a disconnection between it and the lens-capsule, thus favoring the extraction of the entire lenticular system.

The capsule itself, under certain conditions, increases in strength, but loses in volume; or the lens substance may change its consistence, as in Morgagnian cataract; in either case the consequence is that the connection existing between the hyaloid fossa, the lens, and the zonula Zinnii is loosened.

I have said that changes may also take place in the anterior part of the bulb. By this I mean there may be morbid alterations going on favorable to the detachment of the posterior capsule from its connection, dependent upon differences in tension between the anterior and posterior chambers (H. Pagenstecher, "Operat. d. grauen Staars in geschlossener Capsel"), as in iritis and irido-cyclitis, anterior and posterior synechia, etc.

In cases of repeated inflammatory exacerbations, and consequent alterations in intra-ocular tensions, the canal of Petit is widened, the fibers of the zonula atrophy, and the result is that the lens becomes but loosely attached to the hyaloid fossa, or, in some cases, entirely disconnected therefrom.

The same condition results when anterior synechiæ have

existed for a long time; the plastic exudation thrown out by repeated exacerbations may pass into the canal of Petit, and, widening the same, the zonula becomes atrophic, and the capsule is loosened in the fossa.

Since, moreover, it is now known that the glaucomatous process, in the great majority of cases, is due to an inflammatory condition of the iris with consequent hypersecretion, produced by whatsoever cause (generally by an irritation of the ciliary nerves), it follows from what has now been said, that, in all cases of cataracts occurring in secondary glaucomatous eyes, the lens in its capsule is loosened from its connection with the fossa and the zonula Zinnii.

Our operation would, therefore, find its indications in all cataracts, where the union between the capsule and the zonula on the one hand, and the hyaloid fossa on the other, is severed in whole or in part, no matter by what morbid condition this may be produced.

The operation may therefore be performed in the case of a cataract which owes its origin to a disease of the iris (iritis), or of the choroid (choroiditis). The reasons why it is indicated under these conditions have been mentioned above.

Another indication is offered in all cases of *cataracta luxata*, for in these exists either a total, or at all events partial, rupture of the zonula.

Furthermore: all cataracts which are slow in maturing, or which even, as happens at times, may never be perfectly matured. The volume of the lenticular body usually becomes lessened in direct proportion to the slowness of maturation. Such cataracts can easily be loosened from their attachment, and are therefore very favorable to this mode of operation. It is of interest to mention that they occur most frequently in myopic eyes.

The operation may also be performed in the case of Morgagnian cataracts, although it would seem that the capsule would be very apt to rupture. This, however, is not the fact (*v.* H. Pagenstecher, *op. cit.*). It is presumed that such cataracts in their development always lead to atrophy of the zonula and to a consequent loosening or detachment of the lens-capsule from the fossa.

When a cataract is due to so-called choroiditis latens or retinal disease, both of which so often lead to the exudation of lymph on the posterior capsule (cata. polar. post.), thus interfering with the nutrition of the lens, and leading to shrinkage of its corticalis and detachment from its connection, the operation in capsule is indicated.

It is manifest from the above that the operation is not to be performed in every case, but in a great number with which we meet in practice. If, indeed, we were able to remove the lens in its capsule under all conditions, without being obliged to dread inordinate loss of vitreous or rupture of the capsule, we would have arrived at the acme of perfection, inasmuch as we would effectually prevent iritis, together with its succedanea, and always procure for our patients the highest degree of vision.

As I have said, the great predisposing cause of iritis after the usual extraction of cataract is due to the presence of capsular fragments, with or without the adherence of cortical masses. The tendency of the capsule, after it has been injured, that is, opened, is to fold upon itself, contracting in the direction of the axis of the eye, and inclosing a part of the remaining cortex, thus constituting the so-called *crystal-mass* (*Krystallmasse*, Becker). The aqueous humor is therefore prevented from acting on the cortical remnants and can not absorb the same. The crystal-mass, however, comes into close contact with the iritic surface, acting thereby as an irritant, inducing plastic exudation and consequent adhesion of the iris to the capsular fragments.

As the process of shrinkage goes on, traction on the iris is necessarily exerted in direct proportion to that shrinkage, the ciliary body becomes implicated, and the dangers to the eye are excessive. This traction continues until the process of shrinkage or shriveling up is completed. If cortical masses remain and are situated between the margin of the coloboma, and are slow in being absorbed, the plastic exudation increases in intensity and the condition may eventually lead to pupillary occlusion.

The results of the traction may be various:

1. A part of the pupil may be left free after the process of shrinkage of the capsule has been completed.

2. There may be left over a pupillary occlusion which we can remedy by an iridectomy ; or,

3. The process assumes greater dimensions, and, passing to the ciliary body, an iridocyclitis may be produced which may lead to phthisis anterior.

The only way to avoid these disastrous results is to remove the lens in its capsule. It is, in fact, proved by statistics that there is perfect immunity from inflammatory symptoms on the part of the iris after this operation (Alex. Pagenstecher " Klinische Mittheilungen aus der Augenheilanstalt zu Wies baden," 1866).

The pupil, after the bandage is first removed subsequent to the operation in capsule, presents a perfectly clear black area ; and, even if there has been no belladonna instilled, a mydriasis *ad maximum* is produced, often lasting from eight to fourteen days.

If, however, iritic complications *do* take place—through trauma (that is, traction and so forth), or iritic prolapse between the wound margins—the resulting process is nevertheless vastly different from that observed after the ordinary operation ; it does not tend to the production of plastic deposits, and can easily be overcome.

And even if an exudation should take place after the possible iritis in this operation, the fact that the proper base, the anterior capsule, is removed, this exudation is not dangerous, for it ultimately finds its way, either into the vitreous or the aqueous humor, where it may be absorbed sooner or later.

In exceedingly rare instances a so-called base for the exudation may exist in consequence of blood remaining in the anterior chamber. If this blood becomes organized, the margins of the iris may adhere to it and give rise to synechia.

According to Becker (" Graefe-Saemisch," p. 398) secondary cataract, that is, capsular and pyramidal cataracts, may occur without any iritic complication at all ; being due, indeed, merely to the proliferation of the intra-capsular cells which are attached to the anterior capsule, and which, if not

removed, will lead to inflammatory products. All this danger is naturally done away with when the lens is removed in its capsule.

As regards the cyclitis which follows at times this operation (for there is no primary iritis after it, which renders this so vastly superior to the ordinary operation), it may be benign or pernicious; in either case, the great danger of pupillary occlusion is not to be feared, inasmuch as in neither case this form of inflammation possesses a tendency toward plastic exudation. In the mild form there may be simple irritation of the ciliary body, which passes off without the slightest deleterious results; in the pernicious form, owing to excessive loss of vitreous of a normal consistence, or to pulling and consequent irritation of the zonula, and forcibly tearing it from its attachments to the corpus ciliare. This, however, will only be the case when the fibers of the zonula are not atrophic, and can never take place in judicious hands, for the simple reason that the operation in the inclosing capsule—as shown by the classified indications given in the foregoing list —should *only* be performed when there is a supposition, amounting almost to a certainty, that the zonula fibers are atrophic, and that consequently the lens is, in a measure or altogether, disconnected from its attachments.

There is, however, another form of purulent infiltration, entirely distinct from that due to direct traction on the zonula and the corpus ciliare. The course and progress of this form is extremely chronic and slow, but none the less very certain; it differs from the former, inasmuch as this is very acute and rapid. It passes on from one organ to the other, and is due to a septicæmia, which has its origin not in the method of operating employed, but in some other, inexplicable cause.

Antiseptic lotions and bandages may perhaps control it, or the operation may be performed under the carbolic spray, as recommended and done at the Wiesbaden Hospital (H. Pagenstecher, *op. cit.*), and the possible appearance of the process may thus be prevented.

However this may be, it is, happily, a rare complication. It is met with not only in the aged and in those with athero-

matous blood-vessels, but may make its pernicious appearance even in case of the young, and is owing to an unexplained tendency toward malignancy.

But to return : After a cyclitis has taken place the inflammatory process may spread to the vitreous, producing hyalitis; this, the hyalitis, is, however, never a primary condition, but is always called forth by extension from the inflamed surrounding parts. If, indeed, there were such a condition as a primary hyalitis, this mode of operating would be fraught with great danger, because, by the introduction of the instrument used to disjoin the lens-capsule from its fossa, an inflammation of the vitreous would be produced. Luckily, however, this is not the case, for the cells of the vitreous—if indeed such really exist, which is still a mooted question—maintain a strict neutrality and do not in the least participate in the inflammatory process (*v.* article " Zur Pathologie d. Glaskörpers," Knapp and Moos, I. 2., p. 7).

There is indeed but one great danger to the vitreous after the operation of the extraction of the lens in its capsule, namely, the rupture of the hyaloid membrane, and inordinate loss of the healthy hyaline liquid, thus producing various morbid results; that is, opacities, varying from very fine filamentous obscurations to excessively dense infiltrations. These are, in a great measure, due to the fact that when there is loss of vitreous, the anterior limiting membrane being ruptured, the wound-margins are kept from closing, the process of healing is protracted, and lymphoid cells proliferate, passing from the wound and the ciliary into the vitreous (H. Pagenstecher, *op. cit.*). Entering the vitreous body these cells are further developed therein, assume the nature of connective tissue, and give rise to *floceulent* opacities. *Diffuse* opacities of the vitreous, on the other hand, are produced by a chemical metamorphosis, the nature of which is yet unexplained. They are met with more especially in the case of diabetic cataracts, whose altered capsular contents, owing to a certain retrogression and morbid change in its constituent particles, act, in the first place, in a deteriorating manner upon the iris, from thence upon the corpus ciliare, and thence upon the vitreous.

Inflammatory changes of whatever kind going on in the uveal tract, however, may produce the chemical changes in the vitreous spoken of.

The other ill result of rupture of the hyaloid and inordinate loss of vitreous may be shrinkage and collapse of the eye, leading to phthisis bulbi.

However strange it may appear, there is but little deleterious effect upon vision or on the healing process, except that it may retard the same, after the loss of even quite a large quantity of vitreous, provided this is in a fluid state.

Bowman (in "Ophth. Hosp. Rep.," vol. iv., part iv., p. 353) on "Extraction of Cataract," says: "If the posterior capsule has unfortunately been ruptured, in such a case we need not be too anxious to limit the loss of vitreous. The eye often seems even to do better with a loss of two or three minims than of one; and, if any at all be lost, there is often an advantage in encouraging the loss to this extent."

An eye with a fluid vitreous can, indeed, lose twice as much as one with a vitreous of a normal consistence. Moreover, although the tendency to loss of vitreous is present in this operation, the facts show that, if it be well performed, the loss of vitreous need not be very frequent, and not necessarily followed, as above shown, by ill results.

Loss of vitreous, indeed, is not a necessary complication, if the operation does not have as a sequence any rupture or prolapse of the anterior margin of the vitreous.

Normal vitreous need scarcely ever be lost; such loss being chiefly due to three causes, two of which at all events can, to a certain degree, be controlled. I refer to the contraction of the eye-muscles, and the consequent compression of the ball, which, together with violent pressure on the part of the patient himself, are the great predisposing causes, but can be successfully met by the administration of chloroform. This need be only given, however, to such patients as, unable to control themselves, give rise to the well-grounded fear that, by too great pressure, they will induce the grave complication referred to.

The third great cause of loss of vitreous, the elasticity of

the walls of the eye, is very much less frequent than the two just mentioned.

As a rule, however, and especially because of the upward rolling of the eyeball and the consequent difficulty of introducing an instrument between the lens-capsule and the fossa, chloroform need not be administered.

If there is hernia of the vitreous body, the hyaloid bursting or not, that is, if the anterior limiting membrane bulges forward and is thus caught between the wound and heals in that place, the vitreous loses in volume, traction is exerted, and the consequence may be that it becomes detached from the ciliary body.

If this happens, one should *a priori* suppose that there would be consequent detachment of the retina, or, one should imagine, opacities in the vitreous might even after a long time cause such detachment, by a process of shrinkage. This is not the case, however; such shrinking opacities may indeed induce a detachment of the vitreous, but neither this nor that will produce a corresponding detachment of the retina.

I will now describe the mode of operation and after-treatment.

The careful examination of the eye and its appendages prior to the performance of the operation, is, of course, absolutely necessary; that is to say, all affections which might protract the cure or interfere with the surgical procedure should be removed. Existing epiphora must first be remedied; trichiasis must be attended to; ectropium or entropium treated; the condition of the conjunctiva palpebrarum examined; chalazæ removed, and so on. If chloroform is not to be administered, the patient need not be dieted; if an anæsthetic is to be given, however, he should eat no breakfast on the morning of the operation. In either case, it is advisable that he have an evacuation before the operation—in order to prevent his going to stool and the consequent exertion and strain for a day or two subsequent to the operation. This absolute quiet is more especially called for after this than after the ordinary operation, on account of the likely loss of vitreous attending straining.

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An assistant is to have the binocular folding bandage, together with two round pieces of linen sufficient in size to cover the eyeballs perfectly, and two cumuli of raw cotton or lint in order to fill out the hollows up to the orbital ridge, the necessary instruments and atropine (a solution of two grains to the ounce) in readiness, and the patient is then to be placed in the bed in which he is to remain subsequent to the operation, until the process of healing is completed.

If the patient earnestly desires it, or if it is perceived that he does not possess sufficient control over himself—which can be tested in many cases as soon as the stop-speculum is introduced between the lids—chloroform may be administered; as a general thing, however, it should not be given, since the operation can safely be performed without it.

The linear incision lessens the danger of a prolapse of the vitreous, and the upward rolling of the eyeball after the administration of chloroform renders the performance of the operation more difficult, or, at any rate, protracts it unnecessarily. It may be said that Pagenstecher (" Klin. Mittheil.," 1866) insisted on the administration of chloroform; but, as he performed a large flap operation in the sclera, employing Beer's triangular knife to make the incision within the sclerotic, it was deemed necessary, by him, to put the patient under the entire influence of an anæsthetic, in order to remove all danger of muscular contraction, the more as the large and peripheric wound is extremely favorable to a prolapse of vitreous. In the operation as performed by me, the use of the anæsthetic is not necessarily indicated.

If the left eye is to be operated, the surgeon stands before the patient; if the right eye, he takes his position at the head of the bed.

The speculum having been introduced, a fold of conjunctiva together with a little sclera is to be taken up by means of the fixation forceps, near the margin of the limbus corneæ, directly opposite to the point of incision. By this means, the bulb is under perfect control, being well fixed.

The center of the incision therefore lies in the same me-

ridian in which fixation is made. I always employ Graefe's knife, and make the incision as well as the excision in the sclera (about 2''' from the superior corneal margin); the middle of the incision, however, lies in the limbus conjunctivæ corneæ. By doing this, I place the danger of a loss of vitreous at minimum.

It is a recognized fact that the most favorable position for a prolapse is the center of the incision, because at this place is its greatest gaping, or, in other words, its least power of resistance against the intra-ocular contents. It is therefore safest to place this most dangerous point of the incision as far inward as this is possible for the healing process (*vide* Knapp, " Graefe's Arch.," xiv. I. 1868).

We also decrease thereby the tendency to hæmorrhage, inasmuch as we avoid the canal of Schlemm. And last, the wound heals much more rapidly if partly corneal than if entirely scleral.

After the incision has been completed, I apply the fixation forceps near the inferior segment of the cornea and roll the eye very gently downward, without exerting the slightest pressure. I then make a large iridectomy, being careful to replace the edges of the iris in the wound, in order to guard against a prolapse. If posterior synechiæ exist, I break them by means of the silver spatula, and then, removing the speculum, I again resume the fixation forceps in the former position and let the assistant hold it. By means of a backward and forward gliding motion of Daviel's spoon, I exert a slight pressure on the upper wound-margin and sometimes succeed in causing the lens to present itself in capsule between the lips of the incision. If this occurs, I rotate the eye far downward and continue judicious and gradually increasing pressure on the upper wound-margin, together with simultaneous slight pressure by means of the forceps against the lower wall of the eye. If, after slight pressure, the lens does not appear, I abstain from the further employment of this maneuver, for fear of bursting the hyaloid and having loss of vitreous.

Before proceeding with the description of the further steps

of the operation, I will say a few words regarding Pagenstecher's spoon and the one I employ.

He describes it in the following manner: " The spoon I use is made of silver; its shape is that of a lengthy oval, almost imperceptibly wider toward the end than near the handle. It is larger than all others in use. The margins are not precipitately steep, as is the case in the spoon of Waldau, but they are very gradual in their increasing steepness. In spite of this circumstance, however, its depth is quite decided. In general, the concavity of the spoon is in exact proportion to the curvature of the lens. The margins are thin, almost sharp, and very slightly bent inward, so that they do not injure the lens in passing over the surface. As soon, however, as the lens has been received in the concavity, it is firmly held there and cannot slip out."

The instrument I employ can hardly be called a spoon. It consists of a small rim of silver, exactly large enough to inclose the lenticular surface with its capsule. This rim is also a long oval, possessing the transverse and antero-posterior diameters of Pagenstecher's spoon. It was constructed for me by Weiss & Son, of London, and its use has been attended by excellent results, inasmuch as it envelopes and retains the lens in its capsule. Its form is such (being a rim simply and not a spoon) that there is much less danger of dislocating the lens, or of rupturing the hyaloid, since it takes up so little space.

But to proceed: Still keeping possession of the fixation forceps, with which I draw the eye well down, the lids being held apart by an assistant, I now introduce my spoon carefully behind the equator of the lens, letting it glide along the posterior capsule, always preserving strict contact therewith. I continue to insert the spoon between the hyaloid and the posterior capsular surface until the lower lenticular margin is reached, and thus the whole lens is situated within the rim. I now exert a slight pressure on the lower part of the lens, together with slight depression of the handle toward one of the corners of the wound, thus bringing the anterior capsule in close contact with the posterior corneal surface. This latter acts

as a kind of support to the contents of the spoon, that is, the cataract, which, by slight but steady movements, will appear outside. The capsule seldom bursts during this mode of operation; if this does take place, however, the rest of the lenticular mass can be quite easily removed, after the same principles as in linear extraction. As the rupture generally happens when the greater part of the lens is already outside of the wound, the remaining quantity of lens matter is very small.

After the cataract has been extracted within its capsule, atropine and the binocular-pressure bandage are applied, and the patient enjoined to keep perfect rest in the recumbent dorsal position.

Vitreous may or may not be lost; or there may be or may not be a prolapse of the vitreous. A small loss of healthy and a rather profuse loss of fluid vitreous need not cause undue alarm.

If there is a prolapse, it is generally replaced after the lids are closed and a moist sponge applied; if, however, there is a large prolapse of dense vitreous, which will not return even upon the continued application of the moistened sponge to the closed lids, and especially if it causes much gaping, it is best to cut it off with Cooper's scissors.

It may be said in this place that, in every case where there is a loss of vitreous after the incision or the iridectomy, whatever mode of operation had been originally intended, the extraction in capsule should be immediately undertaken.

If there is much bleeding after incision or iridectomy, soft strokes with the spoon on the cornea will suffice to cleanse the chamber, or slight strokes with the lower lid on the cornea will remove the blood.

The different steps of the operation may, in conclusion, be thus summed up:

1. A large linear incision in the limbus corneæ, the points of the in- and excision being within the sclera; the incision to be larger than that of Von Graefe, because the lens is to be removed in its totality.

2. Iridectomy, also large, as the lens and capsule have to pass; care is also to be taken to replace the margins of the coloboma.

3. Pressure to be exerted by means of the fixation forceps, applied near the inferior corneal margin, opposite to the superior corneal incision, and the pressure to be also simultaneously applied on the upper wound-margin by means of the finger or Daviel's spoon; if the lens, however, does not appear, then

4. The spoon is to be introduced gently along the posterior surface of the capsule, between it and the hyaloid, care being taken not to lose the attachment between the posterior capsule and, the spoon; and, to make this attachment firmer, it will be advisable to incline the handle slightly, thus pressing the anterior capsule against the corneal surface.

5. By a careful traction, the lens is then to be delivered in its capsule.

The after-treatment differs in no way from that indicated after the ordinary operation. If a loss of vitreous has taken place, the bandage should be maintained in its position for about forty-eight hours, contraindications not existing, in order to prevent the reopening of the lips of the wound and further loss of vitreous.

Diet should of course be fluid in the first days; and, if the patient has been addicted to the daily use of alcohol, he should not be totally deprived of it, even after the operation and during the healing process; a small quantity should be given him in order to avoid possible delirious attacks, very apt to be produced in such subjects under the pressure-bandage.

If irido-cyclitic attacks appear, they should be met in the usual way—that is, leeches to the temple, the frequent instillation of atropine, calomel internally, and hot applications.

The process of healing varies from twelve days to four weeks, and is of course longer if there has been a prolapse of the vitreous than if this has not taken place.